REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

The claims have been amended for clarity. New claims 120-120 are presented in order to highlight additional patentable aspects of this invention. Support for the new claims is provided for example at page 27, third and fourth full paragraph and page 28, first full paragraph of the WO publication of this application.

The previous rejections have been withdrawn. The now pending rejections are:

(1) Claims 79, 81, 82, 86, 88-97, 100, 102, 103, 106-111, and 118 stand rejected, under 35 USC §103(a), as being unpatentable over Terry et al. (US 2005/00249133) in view of Jorgensen (US 2007/0073805) and Schultz (WO 01/63855).

(2) Claims 83, 84, 99, and 113 stand rejected, under 35 USC §103(a), as being unpatentable over Terry et al. (US 2005/00249133) in view of Jorgensen (US 2007/0073805) and Schultz (WO 01/63855) and further in view of Lucent's 3GPP contribution "Scheduled and Autonomous Mode Operation for the Enhanced Uplink," (R1-030284).

(3) Claims 85, 87, 104, and 105 stand rejected, under 35 USC §103(a), as being unpatentable over Terry et al. (US 2005/00249133) in view of Jorgensen (US 2007/0073805) and Schultz (WO 01/63855) and further in view of Fujitsu's 3GPP contribution "Signaling Framework for Enhanced Uplink Scheduling," (R1-040999, R2-041622).

(4) Claims 98 and 112 stand rejected, under 35 USC §103(a), as being unpatentable over Terry et al. (US 2005/00249133) in view of Jorgensen (US 2007/0073805) and Schultz (WO 01/63855) and further in view of Cheng et al. (US 2004/0228313).

(5) Claims 114-117 and 119 stand rejected, under 35 USC §103(a), as being unpatentable over Cheng in view of Jorgensen (US 2007/0073805).

The Applicants respectfully traverse these rejections based on the points set forth below. In addition, to the extent that these rejections are deemed applicable to new claims 120-129 presented herein, the Applicants respectfully traverse.

Claim 79 defines a transmission scheduling method of a mobile terminal in a mobile communication system, in which a base station: (1) receives from a radio network controller (RNC) quality of service (QoS) attributes of multiple flows to be multiplexed by the mobile terminal onto a dedicated uplink channel, (2) receives a scheduling request from the mobile terminal, wherein the scheduling request (i) comprises an identifier identifying one flow of the plurality of flows and (ii) requests allocation of an uplink resource to the mobile terminal for transmitting data of the plurality of flows to be multiplexed onto the dedicated uplink channel, and (3) schedules the uplink resource for transmission of data of the plurality of flows to be multiplexed onto the dedicated uplink channel by the mobile terminal, based on the identifier identifying the one flow of the plurality of flows and its related QoS attributes received from the RNC.

Paragraphs [0015] to [0021] and [0028] of Terry et al. teach merely a general mechanism of transmitting rate requests for a resource assignment on the E-DCH from a WRTU (i.e. a user equipment/mobile terminal; see paragraph [0002]) to the Node B, which schedules the WRTU and allocates a resource on the E-DCH to the WRTU.

However, as acknowledged in the Office ACTION, the teachings of Terry et al. are deficient *vis-à-vis* present claim 79. In particular:

(1) Terry et al. fail to disclose that the rate requests comprise an indicator identifying one flow of plural flows to be multiplexed onto the dedicated uplink channel;

(2) due to deficiency (1), Terry et al. further necessarily fail to teach scheduling by the Node B based on an identifier identifying one flow of plural flows to be multiplexed on the dedicated uplink channel; and

(3) Terry et al. fail to teach that the Node B receives from the RNC QoS attributes of the plurality of flows.

Terry et al. teach in paragraph [0015] that:

> "The RNC 300 controls overall EU operation by configuring EU parameters for the Node-B 200 and the WTRU 100 such as initial transmit power level, maximum allowed EU transmit power or available channel resources per Node-13."

Although these parameters may be considered QoS attributes, the reference teaches that these parameters relate to the WRTU as such and not to the individual flows.

Therefore, as acknowledged in the Office Action at page 4, lines 12-14, Terry et al. do not teach the subject matter of claim 79 that "the scheduling request (i) comprises an identifier identifying one flow of the plurality of flows" or scheduling by the base station "based on the identifier identifying said one flow of said plurality of flows and its related QoS attributes" or "receiving at the base station from a radio network controller Quality of Service (QoS) attributes of a plurality of flows to be multiplexed onto a single dedicated uplink channel by the mobile terminal." The Office Action furthermore appears to acknowledge that Terry et al. fail to teach signaling of "QoS attributes of the plurality of flows."

At the same time, the Office Action proposes that the Applicants' claimed subject matter

is well known in the art and relies on Jorgensen in this regard as teaching a scheduling request that comprises an identifier identifying one flow of the plurality of flows or scheduling by the Node B based on the identifier.

Jorgensen relates to a packet-centric wireless point to multi-point telecommunications system (see paragraph [0039]). The system of Jorgensen facilitates the provision of IP-flows based on a request-allocation scheme (see paragraph [0400]) and allows for a per-flow QoS differentiation (see paragraphs [0148] and [0149]). Figs. 12I to 12O illustrate the upstream frame format. The upstream transmission subframe 1204 is discussed in paragraph [0461] *et seq.* Reservation request block (RRB) in the upstream shown in Fig. 12K comprises an IP-flow identifier 1234c (see paragraphs [0463] to [0465]). Furthermore, the insertion of the IP-flow identifier in the RRB appears related to the idea of providing a per-IP-flow QoS differentiation (see paragraphs [0470] and [0471] and also paragraphs [0148] and [0149]).

Although the Office Action points to paragraph [0482] of Jorgensen as relating to scheduling based on the IP-flow identifier, this paragraph instead appears to describe that the QoS class is employed in the scheduling decision. Paragraph [0482] of Jorgensen states that the RRBs include a request for a number of slots for a single IP-flow with an IP-flow identifier # and class of the flow. The upstream reservation requests (by IP-flow and class) are queued, by an IP flow QoS class queuing processor, onto different upstream reservation request queues that are provided per (QoS) class. As outlined in connection with Figs. 16A and 16B, the QoS class for the IP-flow is presented to scheduler 634, for example by inclusion in a RRB (see paragraph [0567]). The scheduler operation is described in paragraphs [0568] to [0580] in further detail.

The Applicants note that Jorgensen provides no teaching that the IP-flow identifier of the

RRB is considered in the scheduling decision, but rather the QoS class also indicated in the RRB seems to be used in the scheduling decision (see Fig. 12K, QoS Data Class 1244a; paragraph [0471]). Accordingly, the scheduling of Jorgensen is not based on the IP-flow identifier.

Therefore, it is submitted that Jorgensen fails to teach or suggest the subject matter of amended claim 79 wherein "the scheduling request ... (ii) requests allocation of an uplink resource to the mobile terminal for transmitting data of said plurality of flows to be multiplexed onto the dedicated uplink channel," and the base station schedules "the uplink resource for transmission of data of said plurality of flows to be multiplexed onto the dedicated uplink channel by the mobile terminal, based on the identifier identifying the one flow of the plurality of flows and its related QoS attributes."

It is important to note that claim 79 involves scheduling the transmission of data from plural flows based on a single flow identifier of one flow of these plural flows, whereas in Jorgensen, each IP-flow is scheduled individually. As outlined in paragraphs [0580] and [0581] of Jorgensen, the scheduler determines a reservation slot schedule that is sent to the CPE station by means of a FOB slot 1236g shown in Fig. 12F.

Although there appear to be no further details provided as to how the "reservation grants" (see paragraph [0470]) are communicated to the CPE station (see paragraph [0458]), it is apparent from Jorgensen that each "reservation grant" allocates a respective upstream slot (US) 1218a to 1218m shown in Fig. 12K. Furthermore, each US 1218a to 1218m comprises one MAC PDU as shown in Fig. 12L. As is apparent from this, each US thus comprises data of *only one* of the IP-flows (see paragraphs [0473] and [0459]). Hence, each "reservation grant" allocates a US for the transmission of data of a single IP-flow. Furthermore, the QoS class of each individual IP-

flow is thus taken into account when scheduling the respective IP-flow.

This is in contrast to claim 79 which includes features wherein (1) the scheduling request requests allocation of an uplink resource to the mobile terminal for transmitting data of a plurality of flows to be multiplexed onto the dedicated uplink channel and (2) the base station schedules the uplink resource for transmission of data of the plurality of flows to be multiplexed onto the dedicated uplink channel by the mobile terminal, based on the identifier identifying the one flow of the plurality of flows and its related QoS attributes.

In other words, Jorgenson teaches a scheme involving per-IP-flow scheduling and per-IP-flow QoS differentiation, i.e., there is a respective reservation request and corresponding reservation grant for each of the individual IP-flows, while considering for each reservation request the QoS class of the corresponding IP-flow.

In contrast, claim 79 is directed to multiple-flow-scheduling (i.e., a per-mobile terminal scheduling), wherein there is one scheduling request for transmitting data of multiple flows and one corresponding resource allocation for the multiple flows, while the scheduling decision is based on an identifier (comprised in the scheduling request) identifying the one flow of the plurality of flows and its related QoS attributes (i.e., per-flow QoS differentiation).

Although Jorgensen teaches the inclusion of data of different IP-flows in an upstream transmission subframe 1204 in a time-division multiplex manner as shown in Fig. 12K (upstream slots US 1218a to 1218m), nevertheless the existence of this multiplexing provides no teaching that the IP-flow identifier of the RRB is considered in the scheduling decision, but rather the QoS class also indicated in the RRB appears to be used in the scheduling decision (see Fig. 12K, QoS Data Class 1244a; paragraph [0471]). Accordingly, the scheduling of Jorgensen is not based on

the IP-flow identifier.

New dependent claims 120-129 further distinguish the claimed invention from the teachings of Jorgensen. Claims 120 to 129 recite that the multiplexing is directed to multiplexing the different flows to a single MAC-e PDU (transport block) for which the scheduling assignment is sent (see for example page 27, third and fourth full paragraph; page 28 first full paragraph of the WO publication of this application). In contrast, as noted above, each US 1218a to 1218m of Jorgensen comprises one single PDU of one single IP-flow.

The Office Action takes the position that Schultz et al. teach that QoS attributes of the plurality of flows are received from the RNC at the base station. However, the Applicants respectfully submit that this position reflects a misunderstanding of Schultz et al.

As can be seen in Fig. 2 of Schultz et al., there is no MAC layer implemented in the Node B (MAC-d and MAC-c are terminated in the UE and the RNC). Furthermore, the text passages on page 7, lines 19 to 27 and pages 10 to 15, relate to the consideration of QoS information in the resource allocation. But it is clear from these passages that the scheduling and thus the "QoS consideration" is performed in the RNC. This is also confirmed on page 28, line 19 to 28 and page 29, lines 10 to 20 reciting that the scheduler is located in the MAC layer, i.e., the RNC as per Fig. 2.

Hence, step 805 of Fig. 8 of Schultz et al. referred to in the Office Action fails to teach or suggest that the base station receives from a radio network controller Quality of Service (QoS) attributes of a plurality of flows, as recited in instant claim 79.

With respect to a combination of the teachings of Terry at al., Jorgensen, and Schultz at al., the Applicants note the following. Considering Terry et al, it appears indeed that the

reference teaches "MAC-e multiplexing" (see for example paragraph [0005]). However, when trying to implement a per-flow differentiation as proposed by Jorgensen, one skilled in the art at the time of the present invention would have considered the underlying principle of Jorgensen to achieve a per-flow differentiation, namely, the transmission of data of a single IP flow only per upstream slot (MAC PDU) as shown in Fig. 12L and the transmission of a corresponding RRB per-IP-flow and "reservation grant" per IP-flow. Hence, it would have been clear to a skilled artisan that no MAC-e multiplexing can be used, if the per-flow differentiation of Jorgensen should be implemented in Terry et al.

Hence, when combining the teachings of Terry et al., Jorgensen and Schultz et al., one skilled in the art would not have been led to the transmission of data of a plurality of flows (in one protocol data unit) nor the scheduling of an uplink resource for the transmission of data of multiple flows based on the flow identifier of a single one of these flows.

Furthermore, as noted above, contrary to the position taken in the Office Action, Schultz et al. do not teach that QoS attributes of the plurality of flows are received from the RNC at the base station.

Accordingly, the Applicants respectfully submit that even if Terry et al., Jorgensen and Schultz were combined as proposed in the Office Action, the combination still would lack the above-noted features of claim 79, and thus, these references, considered alone or together, would not have rendered obvious the subject matter of claim 79. Thus, one skilled in the art would not arrive at the invention of claim 79, when considering all three of these documents. Independent claims 100, 114, 116, 118 and 119 similarly recite the above-mentioned subject matter distinguishing method claim 79 from the applied references, with claims 100 and 116

respectively being directed to a base station and a mobile terminal, and claims 118, and 119 being directed to computer readable storage media. With regard to claims 114 and 116, Cheng is not cited in the Office Action for supplementing the teachings of Terry et al., Jorgensen and Schultz with respect to the above-mentioned distinguishing subject matter. Therefore, it is submitted that the rejections applied to claims 83-85, 87, 98, 99, 104, 105, 112, and 113 are obviated, and allowance of claims 79, 100, 114, and 166 and all claims dependent therefrom is therefore deemed to be warranted.

In view of the above, it is submitted that this application is in condition for allowance, and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

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